

**GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM**  
**Instrument Procedures Group**  
**April 24-25, 2001**  
**HISTORY RECORD**

**FAA Control # 01-01-234**

**SUBJECT:** Designation of Maximum Altitudes in the Final Approach Segment

**BACKGROUND/DISCUSSION:** Issue raised by NBAA after examination of SIAPs to Runway 7 at Orlando Executive Airport [KORL].

Apparently due to ATC separation considerations with KMCO traffic, the ILS Rwy 7 and GPS Rwy 7 approaches each designate a maximum altitude of 1160 MSL prior to reaching 2.8 Along-Track miles from the AER.

In the event of a Missed Approach prior to the 2.8 NM ATD fix, pilots may be required to descend during the go around maneuver. A requirement to descend while going around – inside a Final Approach Fix, in Instrument Meteorological Conditions – not only contradicts the universe of pilot training precepts for Primary, Instrument and Type Ratings, it also introduces technical issues which may not have been considered.

First, an approach briefing in a multi-crew cockpit would have to include a discussion of the go around procedure to be followed in the event of a Missed Approach both above and below the MDA/DA. While standard procedure may suffice once the aircraft is below 1160 MSL, the following callouts and crew actions illustrate the absurdity and confusion that would accompany an earlier decision to go around:

*"Going around...."*

*"Reducing Power"*

*"Flaps (approach setting)"*

*"Positive descent" (or should this callout be "negative rate"?)*

*"Gear up"*

*"Ignore any 'TOO LOW - GEAR!' warnings from GPWS"*

Further, the profile view of Jeppesen chart for the GPS Rwy 7 approach implies that the database VNAV path will clear the step-under fix. While this may be true in theory, there are unacceptable aspects to flying the approach in real world IFR conditions.

Calculation reveals that the database VNAV path would approximate 1100 MSL at the 2.8 nm ATD fix – a margin of only 60 feet – assuming zero FTE. Current VDI scaling cannot support that level of precision, nor is it likely that even mandatory use of the FD or even AP would guarantee the required performance.

Worthy of note is the fact that the NDB Approach to the same runway has no equivalent maximum altitude limitation in the Final Approach Segment.

Even if current TERPS policy does not expressly prohibit publication of a maximum altitude in a Final Approach Segment, NBAA feels that the concept merits review by the ACF.

**RECOMMENDATION:** AFS-420 should establish policy in FAA Order 8260.19 to prohibit maximum altitudes within the final approach segment.

**COMMENTS:** This affects FAA Order 8260.19 and AFS-420 policy directives.

**SUBMITTED BY:** Steve Bergner  
Chairman NBAA FMS/Charting Subcommittee  
National Business Aviation Associates, Inc.

Phone: 845-583-5152  
Fax: 845-583-5769 fax  
April 23, 2001

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**Initial Discussion (Meeting 01-01):** Dave Sheehan presented the issue on behalf of NBAA. The issue was prompted by the approach design for SIAP's to runway 7 at Orlando Executive Airport, FL (KORL). Two of the approaches (LOC and GPS) have an altitude restriction of 1160' maximum at ORL 3 DME/2.8 ATD to threshold. In the event of a go-around prior to reaching this point, aircraft may be required to descend during the missed approach maneuver. The restriction is apparently on the procedure for ATC separation considerations with Orlando International (KMCO) traffic. It should also be noted that the VOR/DME RWY 7 SIAP has a maximum altitude of 1100 at ORL 4DME (3.8 NM to threshold), and the NDB RWY 7 SIAP has no restriction. NBAA recommends that AFS-420 establish policy in FAA Order 8260.19 to prohibit maximum altitudes within the final approach segment. After discussion, the subgroup agreed that a maximum or hard altitude restriction in the final approach segment reflects poor procedure design. Marty Walker, ATP-120 agreed to coordinate with Orlando air traffic to determine the need for the restrictions. Brad Rush, AVN-160, agreed to review the design anomalies and the reason for the variances in the fix location. Dave Eckles, AFS-420, will review whether a policy directive is warranted. **ACTION: ATP-120, AVN-160, and AFS-420.**

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**MEETING 01-02:** Dave Sheehan, NBAA, requested that AVN action be placed on hold pending further consideration and coordination between NBAA and ATP-120. Bill Hammett, AFS-420 (ISI) briefed that policy has been added to change 3 to Order 8260.19 to not use maximum or mandatory altitudes in procedure design unless absolutely necessary. Brad Rush, AVN-160, briefed that his office queried the control facility regarding the design anomalies of the KORL RWY 7 SIAPs (the maximum altitude restriction and location is different on three separate SIAPs). Brad reported that ATC did not want to consider any changes. Marty Walker, ATP-120, briefed that the restrictions were needed for capacity. Without the restrictions, the arrival rate for KORL would be reduced from approximately 30 aircraft per hour to 12. Brad challenged the necessity because of the inconsistencies of the restriction points, the restriction altitudes, and missed approach altitudes for the KORL SIAPs. Brad Alberts, FPA, stated that capacity should not override safety and pilot training. Bill Hammett, AFS-420 (ISI) pointed out obvious contradictions between the AIM, Instrument Flying Handbook and the Pilot Controller Glossary (PCG). AIM, paragraph 5-4-5b NOTE, states in part; "...Pilots are cautioned to adhere to altitudes as prescribed because, in certain instances, they may be used as the basis for vertical separation of aircraft by ATC". AIM, paragraph 5-4-19, states; "Therefore, when an early missed approach is executed, pilots should, unless otherwise cleared by ATC, fly the IAP as specified on the approach plate to the MAP at or above the MDA or DH before executing a turning maneuver." The

Instrument Flying Handbook, FAAH 8083-15, page 10-22, also states in part; "...continue to fly the IAP as specified on the approach plate to the MAP at or above the MDA or DA/DH before beginning a turn". Whereas, the definition of MISSED APPROACH the PCG states in part; "...A pilot executing a missed approach prior to the MAP must continue along the final approach course to the MAP. The pilot may climb *immediately* to the altitude specified in the missed approach procedure". These contradictions can lead to pilot confusion and deviation from ATC expectations. Marty Walker, ATP-120 took the IOU to revise the AIM and PCG. **ACTION: NBAA and ATP-120.**

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**MEETING 02-01:** Steve Bergner, NBAA, stated that his organization had coordinated with Air Traffic Management at KORL and was briefed that removal of the final approach segment altitude restrictions would severely impact capacity. Brad Rush again noted the inconsistencies of the restriction points, the restriction altitudes, and the missed approach altitudes for the KORL SIAPs. Norm LeFevre agreed to recommend a Flight Standards retroactive review of the KORL SIAPs in question from a safety perspective. Bill Hammett, AFS-420 (ISI), noted that the current revision to Change 3 to Order 8260.19 will include a note under paragraph 857t: "NOTE: Maximum or mandatory altitudes should be avoided where ever possible, especially in the final approach segment. Maximum or mandatory altitudes in the final approach segment must be coordinated through AFS-420 prior to forwarding the procedure for publication." Bill also noted that the ATP-120 IOU to resolve the contradiction in pilot instructions between the AIM, paragraph 5-4-5b; FAAH 8083-15, page 10-22; and the PCG definition of Missed Approach has not been accomplished. Marty Walker, ATP-120, assured the group that it would be in the next possible revision.

**ACTION: AFS-420 and ATP-120.**

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**MEETING 02-02:** Tom Schneider, AFS-420, briefed that AFS-410/420 convened a technical review board (TRB) to discuss the Orlando Executive (KORL) approaches as agreed at the last ACF. The TRB reviewed all published KORL procedures and made specific recommendations for consideration (A copy of the TRP results is below in italic type). These recommendations will be the source of an action memorandum to be developed by AFS-410 and forwarded to AVN-100 and ATP-120 for consideration by the Atlanta FPO and Orlando ATC. Marty Walker, ATP-120, stated that he has forwarded guidance to resolve the contradiction in pilot actions published in AIM 5-4-5b, FAAH 8083-15, page 10-22, and the PCG definition of "Missed Approach". Brad Alberts, ALPA, stated again that this type altitude restriction goes against all pilot techniques when a missed approach is required. Steve Bergner, NBAA, recommended a note similar to that published on the Teterboro, NJ (KTEB) ILS RWY 19 approach might be a good safety enhancement. This comment will be forwarded to AFS-410 for consideration. Brad Rush, AVN-160, questioned whether the currently published missed approach restrictions to both runways at KORL provided appropriate IFR vertical separation for traffic simultaneously arriving Orlando Int'l. A discussion on separation standards followed, but reached no conclusion. Marty recommended that another TRB be considered to include both ATP-100 and AVN-100 participation. Minutes of the TRP follow **ACTION: AFS-410 & ATP-100.**

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**TECHNICAL REVIEW BOARD (TRB)**  
**ORLANDO EXECUTIVE INSTRUMENT APPROACH PROCEDURES**

A TRB was held on 9/20/2002 to discuss Aeronautical Charting Forum Agenda Item 01-01-234, Designation of Maximum Altitudes in the Final Approach Segment. Participants included the following representatives of AFS-410 and AFS-420:

Hooper Harris  
Jack Corman

Ernie Skiver  
Mike Werner

Tom Schneider  
Bill Hammett

Steve Jackson  
Rich Gastrich

**Issue Synopsis:** Orlando ATC has directed "mandatory" or "at-or-below" altitudes be published either at the final approach fix (FAF), between the FAF and the missed approach point (MAP), and within in the Intermediate Segment, on the approaches to Orlando Executive (KORL) in order to procedurally separate aircraft operating at Orlando International (KMCO). NBAA has raised the issue that in the event of a go-around after the FAF, but prior to the restriction fix, a pilot is expected to descend. NBAA alleges that this design is confusing and potentially unsafe. This missed approach descent scenario is also true of an aircraft executing a missed approach above 1200' on the NDB RWY 7 and ILS RWY 7 approaches (the initial missed approach altitude is 1200 to MARYB).

The TRB agrees that this type restriction is not conducive to good procedure design; however, it is accepted that rules cannot be made to cover all contingencies. Hooper Harris, AFS-410, is very familiar with operations at KORL and provided background on the need to restrict the altitudes on the procedures in question. After lengthy discussion, the following actions are recommended:

1. AIM/AIP guidance will be drafted to make it clear to the pilot that, when executing a missed approach prior to the missed approach point (MAP), the pilot must track the lateral course and adhere to all vertical restrictions within the final approach segment unless authorized otherwise by ATC.

**Action:**

- a. AIM Paragraph 5-4-5b Note (AFS-420 is OPI): Steve Jackson, AFS-420 to revise.
  - b. AIM Paragraph 5-4-19 (ATP-120 is OPI): Steve Jackson and Ernie Skiver, AFS-410 to draft language and forward to ATP-120 for publication.
  - c. Pilot/Controller Glossary (ATP-120 is OPI): Marty Walker, ATP-120 has an IOU from the ACF to resolve the contradiction between the PCG and AIM.
  - d. Steve Jackson, AFS-420, will forward a copy of final revisions to AFS-630 for inclusion in the Instrument Flying Handbook, FAA-H-8083-15.
2. The TRB recommends that the Orlando ATC facility establish internal guidance that requires ATC to issue appropriate missed approach instructions/restrictions to the pilot when either ATC initiates the missed approach OR when first being notified by the pilot that a missed approach is being initiated. This should be spelled out in an Action Memorandum from AFS-410. ATP-120 will be notified of our recommendation.

**Action:** AFS-410 will prepare a memorandum to ATP-120 addressing this requirement.

3. The consensus of the TRB was that "RADAR REQUIRED" should be placed on ALL KORL instrument procedures. Adding RADAR REQUIRED for this purpose is not standard policy as specified in FAA Order 8260.19C, but because of the intricacy of the procedural separation applied to allow for simultaneous operations at KMCO and KORL, it was

*deemed necessary in this situation. Several procedures already have RADAR REQUIRED because they do not contain an IAF.*

**Action:** AFS-410 will include this requirement in the Action Memorandum in paragraph 2 above.

4. *It was noted that on the ILS RWY 7 approach, an at-or-below altitude of 1160 has been established between the FAF and MAP for the Localizer procedure. (NOTE: This restriction is not applicable for aircraft conducting an ILS approach or executing an ILS missed approach.) The TRB suggested that possibly this fix could be adjusted by moving the LOC FAF to accommodate the procedural separation being attempted here. An intermediate stepdown fix could be added if necessary or possibly the establishment of a separate Localizer approach that emulated the ground track and profile of the VOR/DME RWY 7 procedure would be a better option.*

**Action:** AFS-410 will include review of this IAP in the Action Memorandum noted in paragraph 2.

5. *The TRB noted that ATC has invoked some creative altitude restrictions on all of the RWY 25 instrument procedures. It first appeared to require either the FAF or Intermediate stepdown fix altitude be maintained throughout the segment length. These restrictions are defined with plan view notes in addition to the same altitudes defined in the profile view. However, the way these notes in the plan view were placed, these "mandatory" altitudes appeared to require compliance prior to the mandatory fix altitudes in the profile view and would be impossible to accomplish. Following the TRB, AFS-420 and ATA-130 jointly reviewed IACC Specifications against the applicable 8260 series forms supporting the procedures. It was determined that the "mandatory" altitude indications on the plan view should not have been charted. This will be corrected at the next available charting cycle.*

**Action:** Completed

6. *Proposed policy for Change 3 to Order 8260.19, Flight Procedures and Airspace, will require that "at-or-below" and "mandatory" altitude restrictions in the final segment be avoided where ever possible and, where required, must be coordinated through AFS-420 for approval. AFS-410 agreed that this guidance is acceptable.*

**Action:** Tom Schneider, AFS-420, has placed this guidance in the Order 8260.19, Change 3 draft scheduled to go out for formal coordination this week.

*The results of the TRB will be briefed at the upcoming ACF and forwarded through AVN-100 to the Atlanta FPO for coordination and action.*

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**MEETING 03-01:** Rich Gastrich briefed that AFS-410 sent the results of the AFS-400 Technical Review Board (TRB) to ATP-120 for consideration. Bill Hammett, AFS-420 (ISI), noted that the TRB results should have been forwarded through AVN-100 to the Atlanta Flight Procedures Office (FPO) for consideration by the RAPT vice forwarding the information directly to ATP-100. Steve Bergner asked the status of his suggestion that a note be placed on the KORL charts similar to the one used at Teterboro (KTEB). Bill Hammett, AFS-420 (ISI) responded that the suggestion was overlooked and that AFS-420 would evaluate the recommendation at the next TRB. Bill also noted that a review of the applicable publications indicated that no action had been taken by ATP-120 to resolve the contradictions in missed approach guidance published in the AIM (paragraph 5-4-5b), the

Pilot/Controller Glossary (definition of “Missed Approach”), and the Instrument Flying Handbook, page 10-22. Unfortunately, there was no ATP-120 representative in attendance to update this portion of the issue. The following IOUs were assigned: 1) AFS-410 will forward a memorandum denoting corrective actions recommended by the TRB through AVN-100 to the ATL FPO; 2) AFS-420 will evaluate the NBAA note suggestion; and, 3) ATP-120 will resolve the published pilot guidance contradictions. **ACTION: AFS-410, AFS-420 & ATP-120.**

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**MEETING 03-02:** Bill Hammett, AFS-420 (ISI), briefed that a second Procedure Review Board (PRB) telcon was held on June 26<sup>th</sup> to discuss the Orlando Executive procedures and the proposed NBAA recommendations. The board consisted of representatives from FAA HQ (AFS-420, AFS 410, and ATP-120), FAA Southern Region participants from Flight Standards, AVN, and Air Traffic, the NFPO, the Orlando ATC facility, and industry. As a result, procedure amendments have been forwarded for publication on October 30. The amendments add a cautionary note to the missed approach text and revise all final and missed approach altitude restrictions to 1200’. The ACF attendees are asked to review the amended procedures when published and comment at the next meeting. Bill also noted that after reviewing the August 7 AIM change, it appeared that no action had been taken to resolve the contradictions in missed approach guidance (AIM paragraph 5-4-19b), the Pilot/Controller Glossary (definition of “Missed Approach”), and the Instrument Flying Handbook (page 10-22). Marty Walker assured the group that the Pilot/Controller Glossary revision was forwarded for publication. He did not know why it was not in the August 7 change, but assured the group that it would be in the February 19, 2004 issue. **ACTION: All Attendees and ATP-120.**

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**MEETING 04-01:** Brad Rush, AVN-101, briefed that all recommended actions resultant from the AFS-400 PRB have been accomplished by AVN-100. The altitude restrictions on the ILS or LOC and RNAV approaches to runway 7 have been standardized at maximum 1200’ and the missed approach note regarding the 1200’ maximum altitude has also been incorporated. Orlando Int’l is now depicted on all Orlando Executive procedure planviews and visa-versa. The “radar required” note is also published in the AFD. Bill Hammett, AFS-420 (ISI) noted that there was still clean up required on the VOR/DME RWY 7 approach. If this approach is not used simultaneously with Orlando Int’l runway 17 & 18 approaches then the maximum altitude restriction should be deleted. If the approach is used, the restriction should be changed to maximum 1200’ and the missed approach note added. Brad agreed to research this and amend the procedure accordingly. Bill also noted that the February Pilot/Controller Glossary (PCG) was not updated to resolve the contradictions in missed approach guidance [(AIM paragraph 5-4-19b), PCG definition of “Missed Approach”, and the Instrument Flying Handbook page 10-22)]. This has been an ATP-120 tasking since the October 2001 meeting and despite repeated assurances from the previous ATP-120 representative has still not been completed. Vinny Chirasello, AFS-410, stated that his office would follow up this tasking through ATP-120 to ensure submission by August 5 for publication in the February 16, 2005 AIM. **ACTION: AVN-101 and AFS-410/ATP-120).**

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**MEETING 04-02:** Bill Hammett, AFS-420 (ISI) noted at the last meeting that there was still clean up required on the VOR/DME RWY 7 approach at Orlando Executive. If this approach is not used simultaneously with Orlando Int’l runway 17 & 18 approaches then the maximum

altitude restriction should be deleted. If the approach is used, the restriction should be changed to maximum 1200' and the missed approach note added to the procedure. Brad Rush, AVN-101, briefed that subsequent to the last meeting, Orlando ATC has reversed their position and now wants simultaneous use of the VOR/DME RWY 7 approach. Brad further briefed that amendments are in work and should be completed prior to the next meeting.

Bill also noted that the Pilot/Controller Glossary (PCG) was updated in August to resolve the contradiction in the PCG definition of "Missed Approach" with the missed approach guidance in AIM paragraph 5-4-19b, and the Instrument Flying Handbook (page 10-22). Ernie Skiver, AFS-410, added that further expansion of the definition is currently being coordinated with Air Traffic. **ACTION: AVN-101 and AFS-410).**

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**MEETING 05-01:** Brad Rush briefed that the following FDC T-NOTAM was issued for against the VOR/DME RWY 7 approach "FDC 5/1842 ORL FI/T EXECUTIVE, ORLANDO, FL. VOR/CME RWY 7, AMDT 1A... MAXIMUM ALTITUDE AT DITEY: CROSS DITEY AT OR BELOW 1200. NOTE: A DESCENT TO 1200 MAY BE REQUIRED WHEN EXECUTING AN EARLY MISSED APPROACH". This will temporarily resolve the issue pending formal amendment of the procedure. Bill Hammett, AFS-420 (ISI) noted that the amendment is required within 224 days of the NOTAM. Bill further briefed that coordination with Ernie Skiver, AFS-410, indicated that all AIM material regarding "Missed Approach" has been completed.

**Editor's Note:** *Post-meeting research by Brad Rush, NFPO, indicates that the amended procedure will be published on July 7, 2005. This completes all required actions for the issue.*

**ACTION:** No further action required - awaiting procedure publication.

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**MEETING 05-02:** Bill Hammett, AFS-420 (ISI), briefed that the VOR/DME RWY 7 approach at Orlando Executive Airport (ORL) has been amended to revise the maximum altitude at DITEY in the final approach segment to 1200 vice 1100. The early missed approach cautionary note has also been revised to match the other runway 7 IAPs. This makes all final approach restrictions and missed approach cautionary notes for the runway 7 IAPs at ORL identical. All required actions are completed and the issue may be closed.

**Issue Closed.**

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